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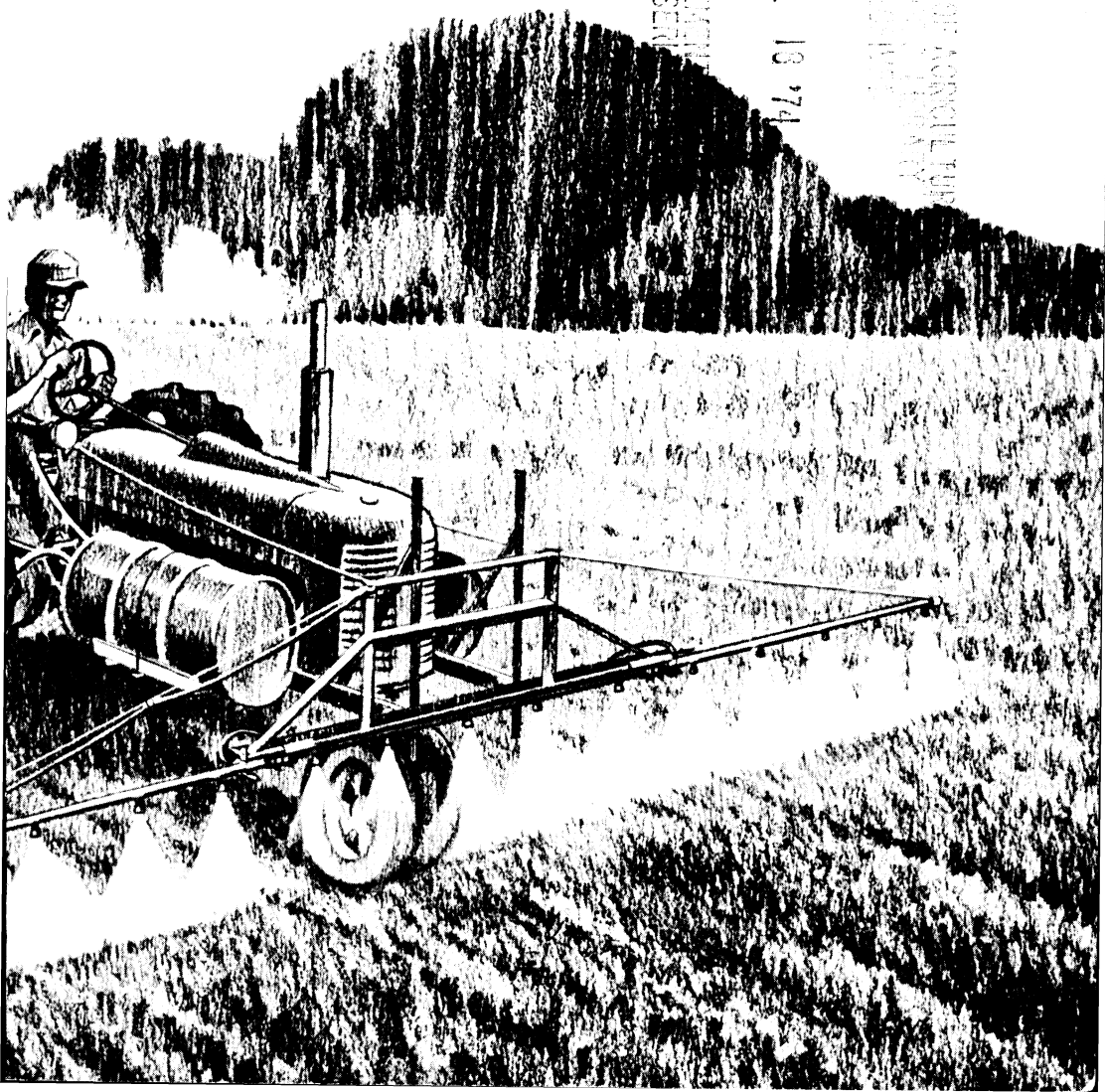
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USING

# PHENOXY HERBICIDES EFFECTIVELY

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## CONTENTS

	Page
How plants react -----	1
Salts and esters -----	1
"Acid equivalent" -----	3
Application -----	3
General principles -----	3
Methods -----	5
Testing output of sprayer -----	6
Cleaning spray equipment -----	9
Susceptibility chart -----	10

The Federal registration for the use of 2,4,5-T around the home, near lakes, ponds, on ditchbanks and on food crops has been canceled. The use of 2,4,5-T for weed control in rice is under appeal. The inclusion of 2,4,5-T or any other herbicide in this publication does not suggest uses other than those covered by Federal registrations.

***This bulletin supersedes Farmers' Bulletin 2005, "Using 2,4-D Safely."***

Washington, D.C.

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# USING PHENOXY HERBICIDES EFFECTIVELY

2,4-D, 2,4,5-T, MCPA, Silvex, 2,4-DB

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Phenoxy herbicides—chiefly 2,4-D, 2,4,5-T,<sup>1</sup> silvex, MCPA, and 2,4-DB—are used widely. They are used for controlling weeds in many crops, on grazing lands, on lawns, and for killing unwanted brush and trees. These herbicides are registered for use and are especially useful because—

- They are selective; they kill most broadleaf plants but do not kill grasses or grain crops.
- They are potent; many species of weeds are controlled by less than 1 pound of active ingredient per acre.
- They are easy to use.
- They are not poisonous to man, domestic animals, or game when applied at the recommended rates.
- They do not accumulate in the soil and they have no harmful effects on soil organisms.
- They are not corrosive to spraying equipment.

## HOW PLANTS REACT

When sprayed with phenoxy herbicides, leaves, green stems, twigs, flowers, and fruits usually

absorb the herbicides. Roots absorb the herbicides sprayed on the soil. When they are applied to growing plants or to the soil, phenoxy herbicides rapidly become distributed in the leaves, stems, and roots and cause susceptible plants to die.

These herbicides are absorbed most readily by plants that are growing rapidly. Annual weeds are easiest to kill when they are young. Perennial weeds are easy to kill while they are seedlings; after they are established, most perennials are easiest to kill at the time flower buds appear.

Some broadleaf weeds are killed by very small amounts of phenoxy herbicides. Some are almost unaffected by very large amounts.

The charts on pages 11 to 24 lists the susceptibility of many common weeds and woody plants to control by 2,4-D, 2,4,5-T,<sup>1</sup> MCPA, silvex, and 2,4-DB.

## SALTS AND ESTERS

Phenoxy herbicides are usually formulated as acids, salts, and esters. Salt and ester formulations usually are supplied as liquid concentrates. The purchaser dilutes them before use. The salt con-

<sup>1</sup> See limitation on use of 2,4,5-T on inside cover.

concentrates form solutions when mixed with water. The ester concentrates form solutions when mixed with oil; they form milky-white emulsions when mixed with water.

*Vapors from ester formulations can kill susceptible plants growing near the area to which the formulations are applied.* Heat causes ester formulations to release vapors. Low-volatile esters vaporize at much slower rates than high-volatile esters. At temperatures below 90° F. there is significant hazard from vapors of high-volatile esters but only slight hazard from low-volatile ones. At high temperatures above 90° F. vapors from low-volatile esters are also a hazard to susceptible plants growing nearby. Nevertheless, the low-volatile esters main-

tain a relative margin of safety at higher temperatures. They are less likely to harm susceptible crops.

Salt formulations are safest. Generally, they do not release enough vapors to cause damage. Most of them are less expensive than esters.

High-volatile esters are usually less expensive than low-volatile esters and they can be used effectively and with moderate safety only if no susceptible crops are growing in the vicinity.

Ester formulations of the phenoxy herbicides are generally more potent, pound for pound, than salts. They penetrate leaves and other plant surfaces more readily than salts. When a range of rates is recommended for herbicide application, use the lower



BN-13721-X

**Weeds in this field of small grain (treated part at right) were controlled with 2,4-D. The herbicide costs less than 50 cents per acre.**

rate for esters and the higher rate for salts.

Esters are more effective than salts for killing weeds that are growing slowly because of drought or cold weather. Esters usually are best for treating weeds in areas of low humidity; esters are formulated in oils and remain in moist contact on foliage longer and penetrate better than salts, which are mixed with water. And, because they are oily, esters are less likely than salts to be washed off foliage if rain falls soon after their application.

## **"ACID EQUIVALENT"**

Phenoxy herbicide concentrates are available in various strengths. The amount of active ingredient in the concentrate is indicated on the container label as the number of pounds of "acid equivalent" in each gallon of concentrate.

Usually the strongest concentrates are the most economical to use; they usually cost less per pound of acid equivalent than weaker concentrates. For example, 1 gallon of a 2,4-D concentrate containing 4 pounds of acid equivalent per gallon usually will cost less than 4 gallons of concentrate containing 1 pound of acid equivalent per gallon, and it contains the same amount of active ingredient.

## **APPLICATION**

### **General Principles**

If phenoxy herbicides are applied carefully they can save you

money and labor. If they are applied carelessly, they can kill your crops.

Some crops and ornamental plants are extremely sensitive to phenoxy herbicides; they are severely injured or killed by small traces of the herbicides, such as spray drift or vapors.

The most sensitive of the crops and ornamental plants include cotton, grapes, tomatoes, cucumbers, tobacco, mimosa, roses, and dogwood. For more information about sensitivity of your crops to phenoxy herbicides, ask your county agricultural agent.

When using phenoxy herbicides near sensitive plants, observe all precautions regarding vapors, spray drift, and cleanliness of equipment.

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### ***Types of Phenoxy Herbicides Commonly Available***

#### **SALTS, such as:**

Amine (triethanolamine, diethanolamine, trimethylamine, diethylamine, dimethylamine and isopropanolamine.

Sodium

Potassium

Ammonium

#### **ESTERS**

##### ***High-Volatile, such as:***

Ethyl

Isopropyl

Butyl

Amyl

##### ***Low-Volatile, such as:***

Butoxyethanol

Butoxyethoxypropanol

Ethoxyethoxypropanol

Isooctyl

Propylene glycol butyl ether

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For safe and effective control of weeds—

- Get professional advice before applying herbicides; ask your county agricultural agent, your State extension weed specialist, or other local agricultural authorities for weed-control recommendations.

- Use herbicides wisely: Follow label precautions. Do not apply herbicides for any use for which they are not registered.

- Avoid spraying on windy days.

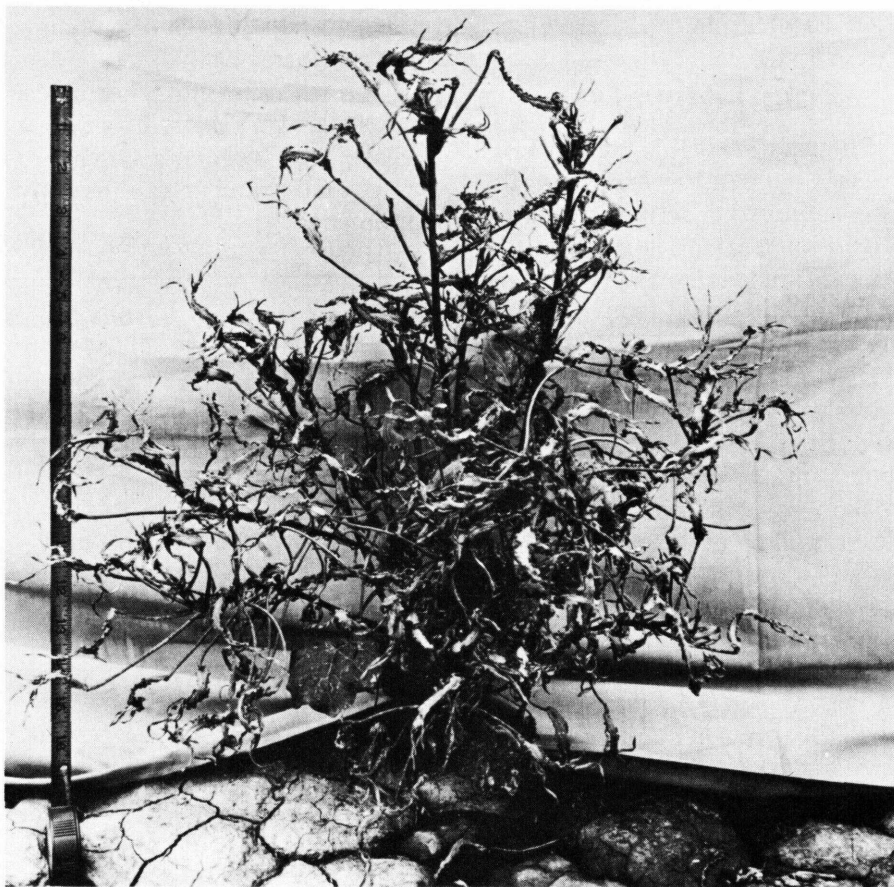
- Do not apply ester formulations when the temperature is above 90°.

- Check output of your sprayer frequently to prevent over-application of herbicides.

- Avoid sprayer skips or overlapping swaths.

- Clean spray equipment immediately after use.

- Before using spray equip-



BN-13680-X

**Cotton is extremely susceptible to phenoxy herbicides. This plant was killed when it was accidentally sprayed with 2,4-D**



ment for applying insecticides or fungicides to crops, test it for injurious traces of herbicides.

## **Methods**

### **Cropland**

You can apply herbicides on cropland as preemergence sprays (after the crop is planted but before it or the weeds come up) or as postemergence sprays (after the crop and weeds come up).

Most modern spray equipment is designed for low-volume application—from about 5 to about 20 gallons of spray per acre. With the proper attachments, low-volume equipment can be used for broadcast spraying, band treatments, or directed spraying.

Apply a broadcast spray if the crop plants are not sensitive to the herbicide.

For broadcast application, the spray rig is equipped with a multiple-nozzle boom or a single boomless nozzle.

Apply a directed spray if the crop plants are somewhat sensitive to the herbicide.

For directed application, the rig is equipped with a boom and drop nozzles, which are adjusted to spray the weeds but no more than the bases of the crop plants.

Airplanes often are used for spraying crops, especially non-row crops, such as small grains, rice, and grazing lands.

### **Noncropland**

Use a ground sprayer with boom to apply low-volume broad-

cast spray for the control of weeds, brush, and trees on grazing land and on irrigation canal banks.

Airplanes often are used for applying low-volume broadcast sprays to noncropland areas that are too large, too rough, or have too many obstructions for ground equipment.

Apply high-volume directed spray to kill brush and trees

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## **Spray Drift**

Wind-carried droplets of phenoxy herbicides may kill susceptible crops near the area that is being treated.

To reduce the danger of damaging crops with spray drift—

- Use nozzles that apply a coarse spray.

- Use low pressures—no more than 35 pounds per square inch for boom sprayers, 100 pounds for spray guns.

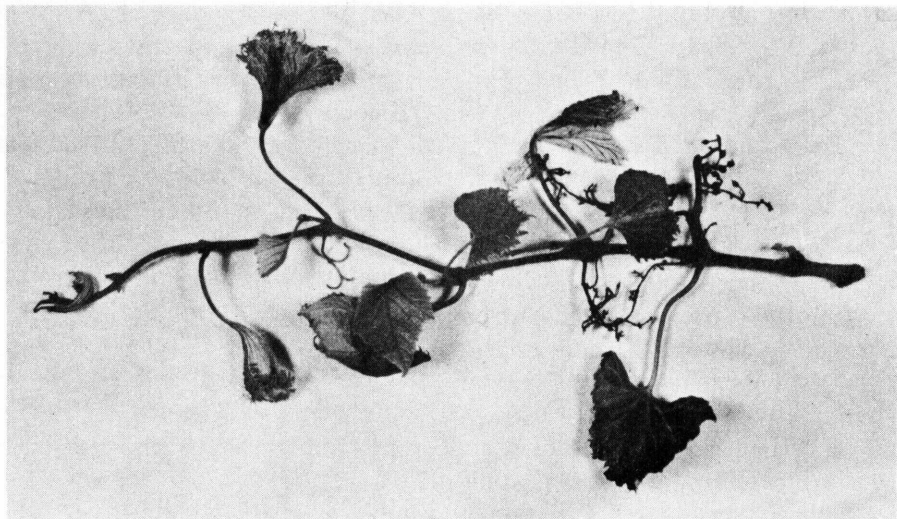
- Avoid spraying on windy days; do not spray with ground equipment or from airplanes when the wind velocity is sufficient to cause drifts to sensitive crops.

- Spray when wind is blowing away from susceptible crops and toward the area being sprayed.

- Where special drift hazards exist, use one of the special drift-control agents or formulations in properly designed and adjusted equipment. Get professional advice before using these.

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BN-13679-X

**Spray drift from a nearby application of phenoxy herbicide severely injured this Concord grape vine.**

along roads, utility lines, and fencerows, and aquatic weeds and brush along irrigation and drainage canals.

Equipment for high-volume spraying usually has a large-capacity spray tank (over 100 gallons per acre of spray may be used) and operates at relatively high pressure (about 60 to 100 pounds per square inch). The rig usually is equipped with a spray hose and adjustable nozzle. The spray often is applied as a drench that thoroughly wets the leaves and stems of the plants that are to be killed.

Apply sprays of ester formulations in diesel oil or kerosene to the bark at the base of small trees or to cuts in the bark at the base of large trees.

Phenoxy ester formulations with oil as a carrier can be ab-

sorbed by the bark at the base of trees with trunk diameters up to about 4 inches. The spray usually is applied with a small hand-operated sprayer and the lower 6 to 12 inches of bark on the trunk is thoroughly wetted with the solution.

The bark of many trees that are over 4 inches in diameter is too thick for the spray to penetrate. To kill these larger trees, it is necessary to ring the base of the tree with ax cuts and spray the ester or amine solution into the cuts. The ax cuts must go through the bark and into the sapwood.

## **TESTING OUTPUT OF SPRAYER**

Before mixing or applying herbicides on cropland, check the output of your spray equipment. If you apply too little herbicide, it is

ineffective. If you apply too much, it may kill your crops.

In the test, the tractor speed and the pump pressure should be the same as they will be when you apply herbicide. If your tractor is not equipped with a speedometer, it is a good idea to make the test on the same type of terrain that you plan to spray and to mark the throttle setting that you use.

To test the output—

- Fill the spray tank with water.

- Spray a strip exactly 220 yards long.

- At the end of 220 yards, stop spraying and measure, in quarts, the amount of water needed to refill the spray tank.

To determine the spray output in gallons per acre, multiply the number of quarts by 16.5 and divide the answer by the width, in feet, of the spray strip.

Example: Your spray rig treats a strip 20 feet wide. At operating speed and pressure, the rig uses



BN-13681-X

This equipment used to apply insecticide to this tobacco plant had been used previously for applying phenoxy herbicide. The tobacco was injured by herbicide traces that remained in the sprayer.

6 quarts of water in 220 yards:

$$6 \times 16.5 = 99.$$

$99 \div 20 = 4.95$ , or about 5 gallons of spray per acre.

The output of the sprayer is for the area treated. If your sprayer is adjusted to apply spray in bands to row crops, calculate the total width of the spray pattern. To do this, multiply the number of nozzles by the width that each nozzle treats.

If you are using 6 drop nozzles and each treats a 20-inch width, then the total width of the spray pattern is 10 feet, regardless of the nozzle spacing.

Output of the spray equipment may change because of enlarged nozzle orifices or worn parts in the pump. Check the output pe-

riodically to prevent application at the wrong rate.

After you know the output of your sprayer, you can mix the spray accurately. To calculate the total amount of spray needed, multiply the area to be sprayed, in acres, by the output per acre. Add the recommended amount of acid equivalent—in the form of herbicide concentrate—to enough carrier (water or oil) to equal the total amount of spray needed.

For example: The calculated output is 5 gallons per acre and you plan to spray 10 acres at a recommended rate of 1 pound of acid equivalent per acre. Therefore you will need a total of 50 gallons of spray containing 10 pounds of acid equivalent.

The herbicide concentrate con-



**The right half of this field was sprayed with 2,4-D before the corn or weeds emerged. The left half of the field was not treated.**

BN-11740-X

## PRECAUTIONS

Phenoxy herbicides are safe when stored, handled, mixed, and used in accordance with label instructions and sound agricultural practices. Most herbicides are low in toxicity. However, some can cause injury to man, many domestic animals, and fish and wildlife if improperly used.

Most herbicides are toxic to many crop plants and ornamentals. Many are volatile and their vapors and spray drift will cause damage to desirable plants. Avoid spraying when windy conditions exist.

Keep herbicides away from children, livestock, and pets. Store herbicides in closed, well-labeled containers in a dry place where they cannot contaminate food, feed, or water.

When handling herbicides wear clean, dry clothing. Launder clothing after each spraying operation before wearing again.

Do not inhale herbicides and avoid contact with spray mist and drift. Avoid repeated or prolonged contact of herbicide with your skin. Avoid spilling it on any part of your body—especially your eyes, nose, and mouth. If you spill it on your body, wash it off with soap and water and remove contaminated clothing.

To protect fish, wildlife, and livestock, do not clean spraying equipment or dump excess spray material near lakes, streams, or ponds.

Empty herbicide containers may be hazardous. Dispose of them in accordance with label instructions and the recommendations of your State Extension weed science specialist or other local agricultural authorities. Do not burn herbicide containers.

tains 4 pounds of acid equivalent per gallon. Add 2½ gallons of concentrate (10 pounds total acid equivalent) to 47½ gallons of water.

## CLEANING SPRAY EQUIPMENT

Clean your spray equipment immediately after using it for applying herbicides.

Some crops can be damaged or

killed by traces of phenoxy herbicides that are left in the sprayer after cleaning. Before applying fungicides or insecticides to crops with equipment that has been used for herbicides, test the equipment for herbicide traces.

Fill the tank with water and spray a few of the crop plants. Sensitive plants such as tomato, cotton, and tobacco are good test plants. Wait a day or two after spraying. If the crop plants show

no distorted growth after this period, the equipment can be used safely for spraying the crop. If the plants are distorted, then clean the spray equipment again. Retest the equipment for cleanliness before using it on crops.

For greatest safety with sensitive crops, apply fungicides or insecticides with equipment that has not been used for applying herbicides.

You can clean spray equipment quickly with a suspension of activated charcoal in water. Use at least one-third of a tank of water. For each 10 gallons of water add  $\frac{1}{4}$  pound of activated charcoal and  $\frac{1}{8}$  to  $\frac{1}{4}$  pound of laundry detergent. Agitate this mixture vigorously to distribute the charcoal through the water.

Wash the equipment for 2 minutes by swirling the liquid around in the tank so that it reaches all parts of the tank. Pump some of the liquid through the hose and nozzles. Then drain the tank and

rinse the equipment with clean water.

## SUSCEPTIBILITY CHART

The chart that follows lists the effects of phenoxy herbicides when applied as foliage sprays on a number of common weeds. Rate of application for 2,4-D, 2,4,5-T,<sup>2</sup> MCPA, or silvex is 1 pound per acre; rate of application for 2,4-DB is 2 pounds per acre.

The control ratings for the herbicides are interpreted as follows:  
Excellent.—One application at rate kills the weed.

Good.—Several applications at rate needed to kill the weed.

Fair.—Repeated applications at rate or application at higher rates needed to kill the weed.

Poor.—Weed kill is erratic, even at high rates of application.

None.—No visible effect.

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<sup>2</sup> See limitation on use of 2,4,5-T on inside cover.

*Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB*

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
Alder ( <i>Alnus</i> spp.)	Woody	Good	Good	Excellent	Excellent	
Alligatorweed ( <i>Alternanthera philoxeroides</i> )	Perennial	Poor	None	Fair	Fair	
Allysum, hoary ( <i>Berteroa incana</i> )	Perennial <sup>3</sup>	Fair	Fair	Excellent		Poor.
Amaranth:						
Green ( <i>Amaranthus hybridus</i> )	Annual	Excellent	Excellent	do	Excellent	Excellent.
Palmer ( <i>A. palmieri</i> )	do	do	do	do		
See also Pigweed.						
Arrowgrass, seaside ( <i>Triglochin maritima</i> )	Perennial	Fair		Fair		
Arrowhead:						
Annual ( <i>Sagittaria calycina</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Do.
Perennial ( <i>S. longiloba</i> )	Perennial	Fair	Fair	Poor		
Ash ( <i>Frazinus</i> spp.)	Woody	None	None	do	Poor	None.
Aster:						
Many-flowered ( <i>Aster ericoides</i> )	Perennial	Good				
Western ( <i>A. occidentalis</i> )	do	Poor		Poor		Do.
White heath ( <i>A. pilosus</i> )	do	Fair		Fair	Fair	Do.
Woody ( <i>Xylorrhiza parryi</i> )	do	Poor	None	Poor	Poor	
Baccharis, coyote brush ( <i>Baccharis salicifolia</i> )	Woody	Excellent				
Baileya, desert ( <i>Baileya multiradiata</i> )	Perennial	Good	Perennial	Good		
Bassia, five-hook ( <i>Bassia hyssopifolia</i> )	Annual	Fair				
Cornflower:						
Batchelor's button ( <i>Centaurea cyanus</i> )	do	Excellent				
Bedstraw:						
Cleavers ( <i>Gallium aparine</i> )	do	Poor	None	Poor	Good	Do.
Smooth ( <i>G. mollugo</i> )	Perennial	None	do	do	do	Do.
Beepplant, Rocky Mountain ( <i>Cleome serrulata</i> )	Annual	Fair				
Beggartick, devils ( <i>Bidens frondosa</i> )	do	Excellent	Excellent	Excellent	Fair	
Florida betony ( <i>Stachys floridana</i> )	Perennial	Poor		Poor		
Bindweed:						
Field ( <i>Convolvulus arvensis</i> )	do	Fair	Fair	Fair	Fair	Fair.
Hedge ( <i>C. sepium</i> )	do	Good	Good	Good		
Biscuitroot ( <i>Lomatium leptocarpum</i> )	do	Fair		do		

See footnotes at end of table.



## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
Bistort, American ( <i>Polygonum bistortoides</i> )	do	do	None	Fair	do	None.
Blackberry ( <i>Rubus</i> spp.)	Woody	None	do	Good	Fair	Do.
Blackeyed susan ( <i>Rudbeckia serotina</i> )	Perennial	Good	do	do	Excellent	
Bloodweed ( <i>Ambrosia aptera</i> )	Annual	Excellent	do	Excellent		
Blueweed, Texas ( <i>Helianthus ciliaris</i> )	Perennial	Fair	do			
Bouncingbet ( <i>Saponaria officinalis</i> )	do	Poor	None	Poor	Poor	Do.
Boxelder ( <i>Acer negundo</i> )	Woody	Good	do	Good	Good	
Bracken ( <i>Pteridium aquilinum</i> )	Perennial	None	None	None	None	Do.
Broomweed, common ( <i>Gutierrezia dracunculoides</i> )	Annual	Good	do	Good	Good	
Broom, Scotch ( <i>Cytisus scoparius</i> )	Woody	do	do	do	None	
Buckeye, California ( <i>Aesculus californica</i> )	do	Fair	do	Poor		
Buckwheat:						
Tartary ( <i>Fagopyrum tataricum</i> )	Annual	Poor	Excellent	Fair	do	
Wild ( <i>F. convolvulus</i> )	do	Fair	Fair	Good	Fair	Good.
Buffalobur ( <i>Solanum rostratum</i> )	do	None	None	None	None	
Bulrush ( <i>Scirpus</i> spp.)	Perennial	Fair	do	Fair	Fair	None.
Burdock, common ( <i>Arctium minus</i> )	Biennial	Excellent	Excellent	Excellent	Excellent	Excellent.
Bur-head ( <i>Echinodorus cordifolius</i> )	Annual	do	do	do	do	
Buckbrush ( <i>Symphoricarpos orbiculatus</i> )	Woody	Good	do	Fair	None	
Western ( <i>S. occidentalis</i> )	do	Fair	None	Poor		
Bullnettle ( <i>Cnidioscolus stimulosus</i> )	Perennial	Good	Fair	Good		
Burweed ( <i>Haplopappus tenuisectus</i> )	do	do	do	Excellent		
Buttercup:						
Celery leaf ( <i>Ranunculus sceleratus</i> )	Annual	Fair	Excellent	Excellent	Excellent	Excellent.
Corn ( <i>R. arvensis</i> )	do	Good	do	do	do	Good.
Creeping ( <i>R. repens</i> )	Perennial	do	do	do	do	Excellent.
Tall ( <i>R. acris</i> )	do	do	do	do	do	None.
Campion, bladder ( <i>Silene cucubalus</i> )	do	None	None	None	None	Excellent.
Carpetweed ( <i>Mollugo verticillata</i> )	Annual	Excellent	do	do	do	Fair.
Carrot, wild ( <i>Daucus carota</i> )	Biennial	Fair	Fair	Fair	Fair	None.
Catchfly, night flowering ( <i>Silene noctiflora</i> )	Annual	None	None	None	None	



Catsear, spotted ( <i>Hypochoeris radicata</i> )	Perennial	Good	Excellent	Excellent	Excellent	Excellent
Catnip ( <i>Nepeta cataria</i> )	do	do	do	do	do	do
Cattail:						
Broadleaf ( <i>Typha latifolia</i> )	do	Fair	Poor	Fair	Fair	Poor
Narrowleaf ( <i>T. angustifolia</i> )	do	do	do	do	do	Do.
Ceanothus ( <i>Ceanothus</i> spp.)	Woody	do	Fair	Good	do	Fair
Wedgeloaf ( <i>C. cuneatus</i> )	do	Good	do	Excellent	do	do
Chamise ( <i>Adenostoma fasciculatum</i> )	do	Fair	Poor	Fair	Poor	Poor
Chickweed:						
Common ( <i>Stellaria media</i> )	Annual	do	do	Good	Excellent	Fair
Field ( <i>Cerastium arvense</i> )	Perennial	do	do	do	do	Poor
Mouseear ( <i>C. vulgatum</i> )	do	do	do	do	do	Do.
Chicory ( <i>Cichorium intybus</i> )	Perennial	Good	Good	Good	Good	Fair
Chockcherry ( <i>Prunus virginiana</i> )	Woody	Poor	do	Fair	Fair	None
Cinquefoil:						
Blueleaf ( <i>Potentilla diversifolia</i> )	Perennial	Fair	Fair	do	do	Do.
Common ( <i>P. canadensis</i> )	do	Good	do	do	do	do
Rough ( <i>P. norvegica</i> )	Annual <sup>3</sup>	Excellent	do	do	do	do
Sulfur ( <i>P. recta</i> )	Perennial	Good	Fair	Good	Fair	do
Cockle:						
Corn ( <i>Agrostemma githago</i> )	Annual <sup>3</sup>	Poor	Poor	None	None	None
White ( <i>Lychnis alba</i> )	Perennial	do	None	do	do	Do.
Cocklebur, common ( <i>Xanthium pensylvanicum</i> )	Annual	Excellent	Fair	Excellent	do	Good
Coffeeweed ( <i>Daubentonia texana</i> )	Woody	do	do	do	Good	do
Coyote brush ( <i>Baccharis pilularis</i> )	do	Good	do	Fair	do	do
Coyotillo ( <i>Karwinskia humboldtiana</i> )	Perennial	do	do	Excellent	Excellent	do
Cranebill, cutleaf ( <i>Geranium dissectum</i> )	Annual <sup>3</sup>	do	do	do	do	do
Cress, hoary ( <i>Cardaria draba</i> )	Perennial	Fair	Fair	Fair	Fair	Fair
Croton:						
Lindheimer ( <i>Croton lindheimeri</i> )	Annual	Excellent	Excellent	Good	Good	Good
Texas ( <i>C. texensis</i> )	do	do	do	Excellent	Excellent	do
Wolly ( <i>C. capitatus</i> )	do	Fair	do	do	do	do
Burcucumber ( <i>Sicyos angulatus</i> )	do	do	Excellent	do	do	do
Cudweed ( <i>Gnaphalium peregrinum</i> )	Annual	None	do	do	do	do
Daisy, oxeye ( <i>Chrysanthemum leucanthemum</i> )	Perennial	Fair	Fair	do	Fair	do
Dandelion ( <i>Taraxacum officinale</i> )	do	Excellent	do	do	do	do
Deadnettle, red ( <i>Lamium purpureum</i> )	Annual <sup>3</sup>	Poor	Poor	do	do	do
Deathcamas ( <i>Zigadacmas gramineus</i> )	Perennial	Fair	do	Poor	do	do
Foothill ( <i>Z. paniculatus</i> )	do	Good	do	Fair	Fair	do

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>			
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver
Deerweed ( <i>Lotus scoparius</i> )	Woody	Excellent		Excellent	
Devil's claw ( <i>Proboscidea louisianica</i> )	Annual	do			
Dock:					
Broadleaf ( <i>Rumex obtusifolius</i> )	Perennial	Good	Fair	Good	Fair
Curly ( <i>R. crispus</i> )	do	do	do	do	Fair
Fiddle ( <i>R. pulcher</i> )	do	Excellent			
Pale ( <i>R. alissimus</i> )	do	Good	Good	Good	Poor
Veiny ( <i>R. venosus</i> )	do	Fair			
Dodder:					
Largeseed ( <i>Cuscuta indecora</i> )	Annual	Poor	None	None	None
Smallseed alfalfa ( <i>C. pentagona</i> )	do	do	do	do	Do.
Smallseed, common ( <i>Lemna minor</i> )	do	do			
Elm ( <i>Ulmus</i> spp.)	Woody	do	None	Fair	Do.
Eveningprimrose, common ( <i>Oenothera biennis</i> )	Biennial	Excellent		Good	
Falseflax, smallseeded ( <i>Camelina microcarpa</i> )	Annual	do			
Fennel, dog ( <i>Eupatorium capillifolium</i> )	do	Good		Excellent	Do.
Fiddleneck, coast ( <i>Amsinckia intermedia</i> )	do	do	Fair	Good	Do.
Fillaree, redstem ( <i>Erodium cicutarium</i> )	Annual <sup>3</sup>	Good			Poor
Fireweed ( <i>Epilobium angustifolium</i> )	Perennial	do		Good	Excellent
Fleabane:					
Annual ( <i>Erigeron annuus</i> )	Annual	Fair	Fair	do	Excellent
Oregon ( <i>E. speciosus</i> )	Perennial	do			
Rough ( <i>E. strigosus</i> )	Annual <sup>3</sup>	Good		Excellent	Good
Flixweed ( <i>Descurainia sophia</i> )	do	Excellent	Fair		
Franseria:					
Bur ( <i>Franseria discolor</i> )	Perennial	Fair			
Woollyleaf ( <i>F. tomentosa</i> )	do	do	Poor	Poor	Poor
Galinsoga, hairy ( <i>Galinsoga ciliata</i> )	Annual	Good	Excellent	Excellent	Do.
Garlic, wild ( <i>Allium vineale</i> )	Perennial	Fair	Poor	Poor	Excellent
Geranium, Carolina ( <i>Geranium carolinianum</i> )	Annual <sup>3</sup>	Good	Excellent	Good	Good
Goatsrue ( <i>Galega officinalis</i> )	Perennial	Fair			
Goldenrod ( <i>Solidago</i> spp.)	do	do			
Gooseberry, sierra ( <i>Ribes roezli</i> )	Woody	Excellent		Good	Good

Goosefoot:	Annual	Fair	Excellent	Excellent	do	Do.
Jerusalem-oak ( <i>Chenopodium botrys</i> )	do	do	do	do	do	Do.
Nettleleaf ( <i>C. murale</i> )	do	Fair	Poor	Fair	Fair	None.
Oakleaf ( <i>C. glaucum</i> )	Perennial	Poor	do	do	Poor	do.
Gooseweed ( <i>Sphenoclea zeylanica</i> )	do	None	Poor	do	do	do.
Gourd, buffalo ( <i>Cucurbita foetidissima</i> )	do	do	do	do	do	do.
Goutweed, Bishops ( <i>Aegopodium podagraria</i> )	do	do	do	do	do	do.
Grapehyacinth ( <i>Muscari botryoides</i> )	do	do	do	do	do	do.
Greenbrier ( <i>Smilax bona-nox</i> )	do	do	do	do	do	do.
Common ( <i>S. rotundifolia</i> )	do	do	do	do	do	do.
Gromwell ( <i>Lithospermum officinale</i> )	Perennial	do	do	do	do	do.
Groundcherry:	do	do	do	do	do	do.
Clammy ( <i>Physalis heterophylla</i> )	Woody	None	do	Fair	Fair	None
Purple flower ( <i>P. lobata</i> )	do	do	do	do	do	do.
Smooth ( <i>P. subglabrata</i> )	do	do	do	do	do	do.
Wrights ( <i>P. wrightii</i> )	Annual	Excellent	do	do	do	do.
Ground-ivy ( <i>Glechoma hederacea</i> )	Perennial	Fair	Poor	Fair	Good	do.
Groundsel:	do	do	do	do	do	do.
Arrowleaf ( <i>Senecio triangularis</i> )	do	do	do	do	do	do.
Common ( <i>S. vulgaris</i> )	Annual	Poor	Poor	do	do	do.
Cressleaf ( <i>S. glabellus</i> )	do	do	do	do	do	do.
Riddell ( <i>S. riddellii</i> )	Perennial	do	do	do	do	do.
Threadleaf ( <i>S. longilobus</i> )	do	Fair	do	do	do	do.
Gum:	do	do	do	do	do	do.
Sweet ( <i>Liquidambar styraciflua</i> )	Woody	Poor	do	do	do	do.
Tupelo or black ( <i>Nyssa sylvatica</i> )	do	do	do	do	do	do.
Gumweed ( <i>Grindelia squarrosa</i> )	Perennial	do	do	do	do	do.
Halogeton ( <i>Halogeton glomeratus</i> )	Annual	Fair	Poor	Poor	Poor	None.
Hawksbeard, smooth ( <i>Crepis capillaris</i> )	Annual	Poor	do	do	do	Poor.
Hawkweed:	do	do	do	do	do	do.
Orange ( <i>Hieracium aurantiacum</i> )	Perennial	Fair	do	Poor	Poor	None.
Yellow ( <i>H. pratense</i> )	do	do	do	do	do	do.
Hawthorn ( <i>Crataegus</i> spp.)	Woody	None	do	Fair	Poor	None.
Healall ( <i>Prunella vulgaris</i> )	Perennial	Good	do	Poor	do	do.
Hellebore, false western ( <i>Veratrum californicum</i> )	do	do	do	do	do	do.
Hemlock, poison ( <i>Conium maculatum</i> )	Biennial	do	do	do	do	do.
Hemp ( <i>Cannabis sativa</i> )	Annual	do	do	do	do	do.
Hempnettle ( <i>Galeopsis tetrahit</i> )	do	Poor	do	do	do	do.
Henbit ( <i>Lamium amplexicaule</i> )	do	do	do	do	do	do.
Hickory ( <i>Carya</i> spp.)	Woody	do	do	do	do	do.

See footnotes at end of table.

*Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB—Continued*

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
Hoppeanut ( <i>Amphicarpa bracteata</i> )	Perennial	Excellent	None	None	None	
Hogpotato ( <i>Hoffmanseggia densiflora</i> )	do	None	None	None	None	Do.
Honey locust ( <i>Gleditsia triacanthos</i> )	Woody	Poor	None	Fair	None	
Honeysuckle ( <i>Lonicera japonica</i> )	do	Fair	Excellent	Good	Good	
Horsebrush, littleleaf ( <i>Tetradymia glabrata</i> )	do	Poor	None	Poor	None	
Horsenettle, Carolina ( <i>Solanum carolinense</i> )	Perennial	do	None	Fair	Fair	Poor.
Horsetail, field ( <i>Equisetum arvense</i> )	do	do	Fair	Poor	Poor	
Horseweed, maretail ( <i>Erigeron canadensis</i> )	Annual	Fair	do	Good	Good	Fair.
Houndstongue ( <i>Cynoglossum officinale</i> )	Biennial	do	None	None	None	
Indian-hemp ( <i>Apocynum cannabinum</i> )	Perennial	Poor	None	None	None	
Indian-tobacco ( <i>Lobelia inflata</i> )	Annual	Fair	None	None	None	
Iris, Rocky Mountain ( <i>Iris missouriensis</i> )	Perennial	do	None	Poor	Poor	Poor.
Ironweed, Western ( <i>Vernonia baldwini</i> )	do	Good	None	Good	None	
Ivy, English ( <i>Hedera helix</i> )	do	do	None	Excellent	None	Poor.
Jerusalem-artichoke ( <i>Helianthus tuberosus</i> )	do	Good	None	do	None	
Jewelweed ( <i>Impatiens pallida</i> )	Annual	Excellent	None	do	None	
Jimmyweed ( <i>Haplopappus pluriflorus</i> )	Perennial	Fair	None	Fair	None	
Jimsonweed ( <i>Datura stramonium</i> )	Annual	Good	Excellent	Good	Good	Excellent.
Jointvetch, Northern ( <i>Aeschynomene virginica</i> )	do	Fair	Fair	Excellent	Fair	None.
Juniper:						
Alligator ( <i>Juniperus deppeana</i> )	Woody	None	None	None	None	Do.
One-seed ( <i>J. monosperma</i> )	do	do	None	do	do	Do.
Utah ( <i>J. osteosperma</i> )	do	Poor	None	Poor	do	Do.
Knapweed:						
Brown ( <i>Centaurea jacea</i> )	Perennial	Fair	None	Poor	Poor	Do.
Diffuse ( <i>C. diffusa</i> )	Biennial	Excellent	Poor	do	do	Do.
Russian ( <i>C. repens</i> )	Perennial	Poor	Excellent	Fair	Good	
Spotted ( <i>C. maculosa</i> )	Biennial	Fair	None	None	None	
Squarrose ( <i>C. virgata</i> var. <i>squarrosa</i> )	Perennial	do	Good	Excellent	Excellent	Excellent.
Knapweed ( <i>Scleranthus annuus</i> )	Annual	None	None	None	None	
Kochia ( <i>Kochia scoparia</i> )	do	Excellent	Good	Excellent	Excellent	

# Knotweed:

Japanese ( <i>Polygonum cuspidatum</i> )	Perennial	Poor	Poor	Poor	do	Poor.
Prostrate ( <i>P. aviculare</i> )	Annual	Fair	Fair	Fair	Fair	
Sakhalin ( <i>P. sachalinense</i> )	Perennial	Good				
Silversheath ( <i>P. argyrocoloon</i> )	Annual	Fair				
Kudzu ( <i>Pueraria lobata</i> )	Perennial	do	Fair	Fair	Fair	Excellent.
Lambquarters, common ( <i>Chenopodium album</i> )	Annual	Excellent	Excellent	Excellent	Excellent	
Larkspur:						
Little ( <i>Delphinium bicolor</i> )	Perennial	None	None	None	None	None.
Menzies ( <i>D. menziesii</i> )	do	Fair	Fair	Fair	None	
Tall ( <i>D. barbeyi</i> )	do	None	None	None	Fair	
Duncecap ( <i>D. occidentale</i> )	do	do	do	do	Fair	
Lettuce:						
Blue ( <i>Lactuca pulchella</i> )	do	Fair	Fair	Fair	Fair	Fair.
Wild ( <i>L. scariola</i> )	do	Excellent				
Loco, bigbend ( <i>Astragalus earlei</i> )	Annual	Excellent				
Locoweed, white ( <i>Oxytropis lambertii</i> )	Annual <sup>3</sup>	Excellent				
Locust, black ( <i>Robinia pseudo-acacia</i> )	Perennial	Fair	Fair	Fair	Fair	
London-rocket, annual ( <i>Sisymbrium irio</i> )	Woody	do	do	do	do	
London-rocket, perennial ( <i>Franseria confertiflora</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent.
Lupine ( <i>Lupinus rivularis</i> )	Perennial	None	None	None	None	None.
Silvery ( <i>L. argenteus</i> )	do	Excellent	Excellent	Excellent	Excellent	
Tailcup ( <i>L. caudatus</i> )	Woody	Fair	Fair	Fair	Fair	Excellent.
Madrone ( <i>Arbutus menziesii</i> )	do	Good				
Mallow:						
Common ( <i>Malva neglecta</i> )	Woody	Fair	Fair	Fair	Fair	
Dwarf ( <i>M. rotundiflora</i> )	Perennial	Poor	Poor	Poor	Poor	
Little ( <i>M. parviflora</i> )	Annual	do	do	do	do	
Venice ( <i>Hibiscus trionum</i> )	do	Good	Excellent	Excellent	Excellent	
Manzanita ( <i>Arctostaphylos</i> spp.)	Woody	do	Poor	Poor	Fair	Poor.
Maples ( <i>Acer</i> spp.)	do	Poor	do	do	do	None.
Marshelder ( <i>Iva xanthifolia</i> )	do	Excellent	Good	Good	Good	Excellent.
Mayweed, dogfennel ( <i>Anthemis cotula</i> )	Annual	Fair	Fair	Fair	Poor	None.
Medic, Black ( <i>Medicago lupulina</i> )	do	do	Fair	Fair	Good	Poor.
Mesquite:						
Honey ( <i>Prosopis juliflora</i> var. <i>glandulosa</i> )	Woody	Poor	Poor	do	Fair	Fair.
Velvet ( <i>P. juliflora</i> var. <i>velutina</i> )	do	None	Good	Good	do	None.
Mexican tea ( <i>Chenopodium ambrosioides</i> )	do	Excellent	Excellent	Excellent	Good	Excellent.
Mexican weed ( <i>Caperonia castaneaefolia</i> )	Annual	Fair	Fair	Good	do	None.

See footnotes at end of table.

*Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silvex, and 2,4-DB—Continued*

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silvex	2,4-DB
Milkweed ( <i>Asclepias curassavica</i> )	Perennial	Good		Excellent	Fair	Do.
Broadleaf ( <i>A. latifolia</i> )	do.	Fair			do.	Do.
Common ( <i>A. syriaca</i> )	do.	None	None	Poor	do.	Do.
Showy ( <i>A. speciosa</i> )	do.	do.	do.	do.	Good	Do.
Eastern whorled ( <i>A. verticillata</i> )	do.	do.	do.	do.	do.	Do.
Mimosa, catclaw ( <i>Mimosa buncifera</i> )	Woody					Poor.
Moneywort ( <i>Lysimachia nummularia</i> )	Perennial	Excellent				
Morningglory:						
Common ( <i>Ipomoea purpurea</i> )	Annual	do.		Excellent		Excellent.
Ivyleaf ( <i>I. hederacea</i> )	do.	do.		do.		Do.
Woolly ( <i>I. hirsutula</i> )	do.	do.	Excellent	do.	Excellent	
Mountain Mahogany ( <i>Cercocarpus montanus</i> )	Woody					
Mudplantain ( <i>Heteranthera limosa</i> )	Annual	Excellent	Good	Poor	Good	Poor.
Mugwort ( <i>Artemisia vulgaris</i> )	Perennial	Poor	None	Good		Fair.
Mulberry ( <i>Morus</i> spp.)	Woody	None		None		
Mullesears ( <i>Wyethia amplexicaulis</i> )	Perennial	Good		Poor	Fair	
Mullein:						
Common ( <i>Verbascum thapsus</i> )	Biennial	Poor	Poor	Fair		None.
Moth ( <i>V. blattaria</i> )	Perennial	Fair		do.		
Mustard:						
Black ( <i>Brassica nigra</i> )	Annual	Excellent	Excellent	Excellent	Good	Excellent.
Blue ( <i>Chorispora tenella</i> )	do.	Fair	Poor	Good	do.	None.
Haresear ( <i>Conringia orientalis</i> )	do.	Excellent	Good			
Hedge ( <i>Sisymbrium officinale</i> )	do.	do.	Excellent	Excellent	Excellent	Excellent.
Indian ( <i>Brassica juncea</i> )	do.	do.	do.	do.	Good	Do.
Tumble ( <i>Sisymbrium altissimum</i> )	do.	do.	Good	do.	do.	Do.
Wild ( <i>Brassica kaber</i> )	do.	do.	Excellent	do.	Good	Do.
Wormseed ( <i>Erysimum cheiranthoides</i> )	do.	do.	do.	do.		Do.
Nettle:						
Stinging ( <i>Urtica dioica</i> )	Perennial	Good				
Tall ( <i>U. procera</i> )	Annual	do.				
Niggerhead ( <i>Rudbeckia occidentalis</i> )	Perennial	do.				

Nightshade:

Black ( <i>Solanum nigrum</i> )	Annual	Fair	Fair	Fair	Good	Fair.
Cutleaf ( <i>S. triflorum</i> )	do	do	do	do	do	do
Silverleaf ( <i>S. elaeagnifolium</i> )	Perennial	Poor	Poor	Poor	Poor	Poor
Norcal bean ( <i>Sophora secundiflora</i> )	do	do	do	do	do	do
Nutsedge:						
Purple ( <i>Cyperus rotundus</i> )	do	Poor	Poor	None	None	None.
Yellow ( <i>C. esculentus</i> )	do	do	do	do	do	Do.
Oak:						
Black ( <i>Quercus velutina</i> )	Woody	do	do	do	Fair	Do.
Blackjack ( <i>Q. marilandica</i> )	do	do	do	None	do	Poor.
Blue ( <i>Q. douglasii</i> )	do	do	do	Poor	Fair	Do.
Gambel ( <i>Q. gambelii</i> )	do	do	do	Poor	Poor	Do.
Interior live ( <i>Q. wislizenii</i> )	do	Poor	Poor	None	Good	None.
Post ( <i>Q. stellata</i> )	do	Fair	Fair	Poor	Fair	Poor.
Scrub ( <i>Q. dumosa</i> )	do	Poor	Poor	do	do	do
Shinnery ( <i>Q. havardi</i> )	do	Fair	Fair	do	Excellent	do
Turbinella ( <i>Q. turbinella</i> )	Woody	do	do	do	Poor	Poor.
White ( <i>Q. alba</i> )	do	Fair	Fair	None	Good	None.
Onion, wild ( <i>Allium canadense</i> )	Perennial	do	do	Poor	Poor	Poor.
Orache ( <i>Atriplex hastata</i> )	Annual	Good	Good	do	Excellent	do
Osage-orange ( <i>Maclura pomifera</i> )	Woody	Poor	Poor	do	do	do
Parsley, desert ( <i>Lomatium grayi</i> )	Perennial	Excellent	Excellent	do	do	do
Parsnip, wild ( <i>Pastinaca sativa</i> )	Biennial	do	do	do	do	do
Partridgepea ( <i>Cassia fasciculata</i> )	Annual	do	do	do	do	do
Passionflower, Maypop ( <i>Passiflora incarnata</i> )	Perennial	Fair	Fair	do	do	do
Peavine ( <i>Astragalus emoryanus</i> )	Annual	do	do	do	do	do
Pellitoryweed ( <i>Parietaria floridana</i> )	do	do	do	do	do	do
Pennycress, field ( <i>Thlaspa arvense</i> )	do	do	do	do	do	do
Pennywort, lawn ( <i>Hydrocotyle sibthorpioides</i> )	Perennial	Good	Good	do	do	do
Penstemon, Rydberg ( <i>Penstemon rydbergii</i> )	do	Fair	Fair	do	Poor	do
Pepperweed:						
Field ( <i>Lepidium campestre</i> )	Annual	Excellent	Excellent	do	do	do
Perennial ( <i>L. latifolium</i> )	Perennial	Fair	Fair	do	do	do
Virginia ( <i>L. virginicum</i> )	Annual	Excellent	Excellent	do	do	do
Yellowflower ( <i>L. perfoliatum</i> )	do	do	do	do	do	do
Persimmon ( <i>Diospyros virginiana</i> )	Woody	Poor	Poor	do	do	do
Texas ( <i>D. texana</i> )	do	Excellent	Excellent	do	do	do

See footnotes at end of table.



## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
<b>Pigweed:</b>						
Prostrate ( <i>Amaranthus graecizans</i> )	Annual	do	Excellent	Excellent	do	Do.
Rough ( <i>A. retroflexus</i> )	do	do	do	do	Excellent	Do.
Tumble ( <i>A. albus</i> )	do	do	do	do	do	Do.
Pineappleweed ( <i>Matricaria matricarioides</i> )	do	Fair	Poor	None	Poor	None.
<b>Plantain:</b>						
Blackseed ( <i>Plantago rugelii</i> )	Perennial	Excellent	Excellent	Excellent	Good	Excellent.
Broadleaf ( <i>P. major</i> )	do	do	do	do	Excellent	Do.
Buckhorn ( <i>P. lanceolata</i> )	do	do	Good	do	do	Do.
Poison-ivy ( <i>Rhus radicans</i> )	Woody	Fair	Fair	do	do	None.
Poison-oak ( <i>Rhus diversiloba</i> )	do	do	Poor	do	do	Do.
Pokeweed ( <i>Phytolacca americana</i> )	Perennial	do	Fair	Good	Good	
Pondweed ( <i>Potamogeton</i> spp.)	do	do	None	Poor	Poor	
Ponyfoot ( <i>Dichondra repens</i> )	do	do	do	do	do	
Poorjoe ( <i>Diodia teres</i> )	do	do	Fair	Good	Good	
Poppy, Roemer ( <i>Roemeria refracta</i> )	Annual	do	do	Poor	Poor	
Prickly-ash, Northern ( <i>Xanthoxylum ameri-</i> <i>canum</i> )	do	do	Fair	Good	Fair	Fair.
Pricklypear ( <i>Opuntia</i> spp.)	Woody	Poor	do	Fair	do	
Prickly poppy ( <i>Argemone intermedia</i> )	Perennial	do	do	do	do	
Purslane, common ( <i>Portulaca oleracea</i> )	Annual	Excellent	do	do	do	
Puncturevine ( <i>Tribulus terrestris</i> )	do	Fair	Fair	Excellent	Good	Good.
Pusley, Florida ( <i>Richardia scabra</i> )	do	Good	do	do	Fair	Do.
Queensdelight ( <i>Stillingia sylvatica</i> )	do	Excellent	do	do	do	
Rabbitbrush:	Perennial	None	do	do	do	
Gray ( <i>Chrysopsis nauseosus</i> )	Woody	Fair	Poor	Poor	Poor	
Yellow ( <i>C. viscidiflorus</i> )	do	do	do	do	do	
Radish, wild ( <i>Raphanus raphanistrum</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Excellent.
<b>Ragweed:</b>						
Common ( <i>Ambrosia artemisiifolia</i> )	do	do	do	do	do	Do.
Giant ( <i>A. trifida</i> )	do	do	do	do	do	Do.
Western ( <i>A. psilostachya</i> )	Perennial	Good	do	do	do	Do.

Ragwort, tansy ( <i>Senecio jacobaea</i> )	Perennial <sup>3</sup>	do	Fair	Fair	Fair	Poor.
Rape, Bird ( <i>Brassica rapa</i> )	Biennial	Excellent	Excellent	Excellent	Excellent	Excellent.
Raspberry ( <i>Rubus</i> spp.)	Woody	Poor	do	do	do	None.
Redbay ( <i>Persea borbonia</i> )	do	do	do	do	do	Do.
Redbud ( <i>Cercis occidentalis</i> )	do	do	do	do	do	Good.
Redvine ( <i>Brunnichia cirrhosa</i> )	Perennial	None	None	None	None	
Redstem ( <i>Ammannia coccinea</i> )	Annual	Excellent	Excellent	Excellent	Excellent	
Rose:						
California ( <i>Rosa californica</i> )	Woody	None	Fair	Fair	Fair	
Cherokee ( <i>R. laevigata</i> )	do	Fair	do	do	do	
Macartney ( <i>R. bracteata</i> )	do	do	do	do	do	
Multiflora ( <i>R. multiflora</i> )	do	Poor	do	do	do	
Prairie ( <i>R. pratincola</i> )	do	Fair	do	do	do	
Woods ( <i>R. woodsii</i> )	do	None	do	do	do	
Rubberweed:						
Bitter ( <i>Hymenoxys odorata</i> )	Annual	Excellent	do	do	do	
Colorado ( <i>H. richardsoni</i> )	Perennial	Good	do	do	do	
Rue, African ( <i>Peganum harmala</i> )	do	do	do	do	do	
Sage:						
Creeping ( <i>Salvia sonomensis</i> )	do	Good	Fair	Good	Good	Fair.
Purple ( <i>S. leucophylla</i> )	do	do	do	do	do	
White ( <i>S. apiana</i> )	Perennial	Good	do	do	do	
Sagebrush:						
Big ( <i>Artemisia tridentata</i> )	do	do	do	do	do	
California ( <i>A. californica</i> )	Woody	Excellent	Poor	Good	Good	None.
Sand ( <i>A. filifolia</i> )	do	do	Good	do	do	Poor.
Salsify:						
Common ( <i>Tragopogon porrifolius</i> )	Biennial	Good	do	do	do	
Meadow ( <i>T. pratensis</i> )	do	do	do	do	do	
Saltcedar ( <i>Tamarix gallica</i> )	Woody	Poor	do	do	do	
Sedge, Umbrella ( <i>Cyperus difformis</i> )	Annual	Fair	do	do	do	
Sesbania, coffeebean ( <i>Sesbania exaltata</i> )	do	do	do	do	do	
Sorrel ( <i>Rumex acetosa</i> )	Perennial	Good	Fair	do	do	
Heartwing ( <i>R. hastatulus</i> )	do	Excellent	do	do	do	
Red ( <i>R. acetosella</i> )	do	do	do	do	do	
Shepherdspurse ( <i>Capsella bursa-pastoris</i> )	do	do	do	do	do	
Sicklepod, coffeeweed ( <i>Cassia tora</i> )	Annual	Good	do	do	do	
Skunkcabbage ( <i>Symplocarpus foetidus</i> )	do	Excellent	do	do	do	
Smartweed:	Perennial	Good	do	do	do	
Ladysthumb ( <i>Polygonum persicaria</i> )	Annual	do	Fair	do	do	Do.

See footnotes at end of table.

## Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB—Continued

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
Pennsylvania ( <i>P. pensylvanicum</i> )	do.	do.	do.	do.	Fair	Do.
Swamp ( <i>P. coccineum</i> )	Perennial	Poor				
Snakeroot, white ( <i>Eupatorium rugosum</i> )	do.	Fair		Fair	Poor	
Snakeweed:						
Broom ( <i>Gutierrezia sarothrae</i> )	do.	do.	Fair	do.	do.	Poor.
Threadleaf ( <i>G. microcephala</i> )	do.	Good		Good	Good	
Sneezeweed, bitter ( <i>Helenium tenuifolium</i> )	Annual	Excellent	Excellent	Excellent	Excellent	Good.
Snow-on-the-mountain ( <i>Euphorbia marginata</i> )	do.	Fair		Good		Fair.
Sowthistle:						
Annual ( <i>Sonchus oleraceus</i> )	do.	Excellent	Excellent	Excellent		Excellent.
Perennial ( <i>S. arvensis</i> )	Perennial	Fair	Fair	Fair	Fair	Fair.
Spiny ( <i>S. asper</i> )	Annual	Excellent		Excellent		Excellent.
Spanishneedles ( <i>Bidens bipinnata</i> )	do.	do.	Excellent	do.	Excellent	
Speedwell:						
Common ( <i>Veronica officinalis</i> )	Perennial	Poor	None	None	Poor	None.
Corn ( <i>V. arvensis</i> )	Annual	do.	do.	do.	do.	Do.
Purslane ( <i>V. peregrina</i> )	do.	Fair	do.	Fair		
Spikerush ( <i>Eleocharis palustris</i> )	Perennial	do.	Fair	Poor	Poor	Poor.
Spurge:						
Flowering ( <i>Euphorbia corollata</i> )	do.	Poor		Good		
Leafy ( <i>E. esula</i> )	do.	do.	None	Poor	Fair	None.
Spotted ( <i>E. maculata</i> )	Annual	do.		do.	Fair	
Spurry, corn ( <i>Spergula arvensis</i> )	do.	do.	Fair	None	Fair	Do.
Squawberry ( <i>Rhus trilobata</i> )	Woody					
Starthistle, yellow ( <i>Centaurea solstitialis</i> )	Annual	Fair		Poor		Poor.
Sticktight, European ( <i>Lappula echinata</i> )	do.	do.				None.
Strawberry, wild ( <i>Fragaria</i> spp.)	Perennial	Good				
St. Johnswort ( <i>Hypericum perforatum</i> )	do.	Poor	None	Poor	Fair	Do.
Spotted ( <i>H. punctatum</i> )	do.	do.				
Sumpweed, rough ( <i>Iva ciliata</i> )	Annual	Fair		Fair		
		Excellent				

Sunflower ( <i>Helianthus annuus</i> )	do	do	do	Good	Excellent	Excellent	Excellent.
Sweetclover, annual yellow ( <i>Melilotus indica</i> )	do	do	do	Excellent	do	do	Do.
Tanoak ( <i>Lithocarpus densiflora</i> )	Woody	do	Poor	do	Poor	Poor	Poor.
Tansy ( <i>Tanacetum vulgare</i> )	Perennial	do	Fair	do	Fair	do	do
Tansymustard ( <i>Descurainia pinnata</i> )	Annual	do	Excellent	do	do	do	do
Thisle:							
Blessed ( <i>Cnicus benedictus</i> )	do	do	do	do	Fair	do	do
Blue ( <i>Echium vulgare</i> )	Biennial	do	Fair	Fair	do	do	do
Bull ( <i>Cirsium vulgare</i> )	do	do	Excellent	do	Excellent	do	do
Bristly ( <i>C. horridulum</i> )	Perennial <sup>3</sup>	do	Fair	do	do	do	do
Canada ( <i>C. arvense</i> )	Perennial	do	do	Fair	Fair	Fair	Fair.
Russian ( <i>Salsola kali</i> )	Annual	do	Good	Good	Good	Good	Good.
Tickseed ( <i>Coreopsis tinctoria</i> )	do	do	do	do	Excellent	do	do
Toadflax:							
Blue ( <i>Linaria canadensis</i> )	Perennial	do	Poor	do	do	do	do
Yellow ( <i>L. vulgaris</i> )	do	do	None	None	None	None	None.
Toyon ( <i>Heteromeles arbutifolia</i> )	Woody	do	Good	Fair	Fair	Fair	Fair.
Tree-of-heaven ( <i>Ailanthus altissima</i> )	do	do	Fair	None	Excellent	Good	Poor.
Trumpet creeper ( <i>Campsis radicans</i> )	do	do	Poor	do	Fair	Excellent	None.
Velvet-leaf ( <i>Abutilon theophrasti</i> )	Annual	do	Excellent	Good	Good	do	Excellent.
Vervain:							
Blue ( <i>Verbena hastata</i> )	Perennial	do	do	do	do	do	do
Hoary ( <i>V. stricta</i> )	do	do	Good	do	do	do	do
Prostrate ( <i>V. bracteata</i> )	do	do	Excellent	do	do	do	do
Roadside ( <i>V. bonariensis</i> )	do	do	Good	do	do	do	do
Vetch:							
Narrowleaf ( <i>Vicia angustifolia</i> )	Annual	do	Excellent	Fair	Excellent	Excellent	do
Milk ( <i>Astragalus</i> spp.)	Perennial	do	Good	do	Good	do	do
Two grooved ( <i>A. bisulcatus</i> )	do	do	Excellent	do	do	do	do
Wild ( <i>Vicia</i> spp.)	Annual	do	do	Excellent	do	do	do
Violet ( <i>Viola</i> spp.)	Perennial	do	Poor	do	do	do	do
Walnut, black ( <i>Juglans nigra</i> )	Woody	do	Excellent	do	do	do	do
Waterhemlock, spotted ( <i>Cicula maculata</i> )	Perennial	do	Good	do	do	do	do
Water-hyacinth ( <i>Eichhornia crassipes</i> )	do	do	do	do	do	do	do
Waterplantain ( <i>Alisma triviale</i> )	do	do	do	do	do	do	do
Waterweed, Canada ( <i>Elodea canadensis</i> )	do	do	Excellent	do	do	do	do
Willow ( <i>Salix</i> spp.)	do	do	Fair	do	do	do	do
Willowweed ( <i>Striga asiatica</i> )	Woody	do	Good	Good	Good	Good	Good.
Woodsorrel, yellow ( <i>Oralis stricta</i> )	Annual	do	Excellent	do	do	do	do
	Perennial	do	Poor	None	Excellent	do	Excellent.

See footnotes at end of table.

*Susceptibility of common weeds to control by 2,4-D, MCPA, 2,4,5-T, silver, and 2,4-DB*

Plant name	Type of plant	Control <sup>1</sup>				
		2,4-D	MCPA	2,4,5-T <sup>2</sup>	Silver	2,4-DB
Wormwood, annual ( <i>Artemisia annua</i> )	Annual	Good	Fair	Good		
Yankee-weed ( <i>Eupatorium compositifolium</i> )	Perennial	Fair		Fair		
Yarrow:						
Common ( <i>Achillea millefolium</i> )	do.	Poor	Poor	Poor	Poor	None.
Western ( <i>A. lanulosa</i> )	do.	Fair		Fair		Do.
Yellow-rocket ( <i>Barbarea vulgaris</i> )	Perennial <sup>3</sup>	Good	Good	Good	Fair	Fair.
Yerba-santa ( <i>Eriodictyon californicum</i> )	Woody	Excellent	do.	do.	do.	None.
Yucca, soapweed ( <i>Yucca glauca</i> )	Perennial	None		Poor	do.	

<sup>1</sup> For explanation of control ratings, see "Susceptibility Chart," page 10.

<sup>2</sup> See limitation on use of 2,4,5-T on inside cover.

<sup>3</sup> Sometimes biennial.

## COMMON AND CHEMICAL NAMES OF PHENOXY HERBICIDES

<i>Common name</i>	<i>Chemical name</i>
2,4-D -----	(2,4-dichlorophenoxy) acetic acid
2,4,5-T -----	(2,4,5-trichlorophenoxy) acetic acid
Silvex -----	2-(2,4,5-trichlorophenoxy) propionic acid
MCPA -----	[(4-chloro- <i>o</i> -tolyl)oxy] acetic acid
2,4-DB -----	4-(2,4-dichlorophenoxy) butyric acid

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